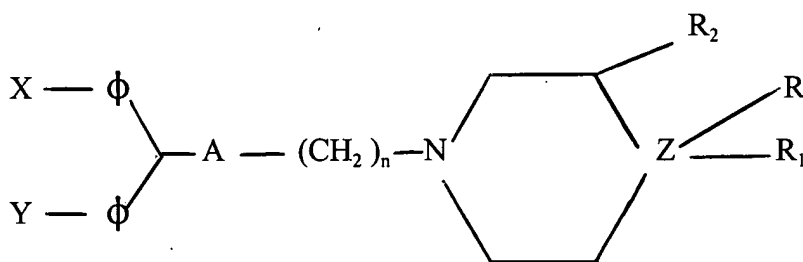


CLAIMS

1. A piperazine or piperidine dopamine, norepinephrine or serotonin ligand having the formula:

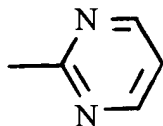
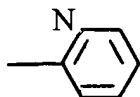
Formula I



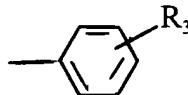
wherein:

A is oxygen or nitrogen; n is an integer of 2 to 6; X and Y can be the same or different and are hydrogen, halogen, nitro, alkyl or halalkyl, Z is carbon or nitrogen; and ϕ is phenyl, naphthyl, thienyl or pyridinyl;

when Z is carbon, R is hydrogen, cyano, hydroxy, $-\text{COOCH}_3$, $-\text{CH}_2\text{OH}$ or $-\text{COOH}$; R_1 is 4-fluorophenyl, 4-chlorophenyl, 4-trifluoromethyl-3-chlorophenyl, 4-bromophenyl, 4-(2-keto-1-benzimidazoliny) or 1-phenyl 1, 3, 8- triazaspiro [4,5] decan-4-one and when Z is nitrogen, R and R_1 combined are



or



wherein R_3 is halo, alkyl, cyano or nitro and R_2 can be hydrogen or

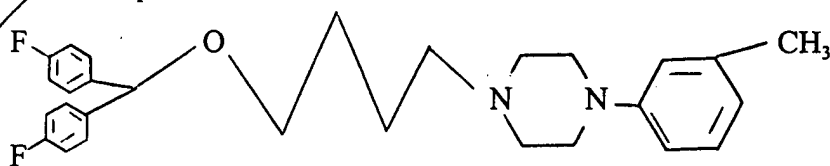


wherein R_4 is halo, alkyl, cyano, nitro, alkynyl or alkenyl.

2. A compound of the formula :



3. A compound of the formula :



4. A compound of the formula :



wherein R₅ is hydrogen halo, alkyl, cyano or nitro.

5. The compound of any one of claims 1, 2, 3 or 4 which is labeled with a radionuclide.

6. The compound of claim 5 wherein said radionuclide is ^{99m}Tc.

7. The compound of claim 5 wherein said radionuclide is an iodine isotope.

8. The method for imaging dopamine neurons in a mammal which comprises:

administering to the mammal an imaging dose of the compound of claim 1 labeled with a radionuclide and

detecting binding of the compound in the mammal.

